



Section 5. Regional studies and human geography

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ADAPTIVE ORGANIZATIONAL MODEL OF A SPECIALIZED INFECTIOUS HOSPITAL DURING THE COVID-19 PANDEMIC

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Abstract

Objective: To evaluate the effectiveness of an adaptive organizational model implemented in a specialized infectious hospital during the COVID-19 pandemic.

Materials and Methods: A retrospective–prospective organizational study was conducted at the Republican Specialized Hospital “Zangiota-1” (2020–2025). Aggregated data from 123,441 hospitalized patients were analyzed, including bed capacity, length of stay, ICU transfers, staffing, and resource provision. Organizational-analytical, comparative, and statistical methods were applied ($p < 0.05$).

Results: The hospital was reorganized into a referral infectious center with dynamic bed management, functional zoning, and centralized governance. Implementation of flexible bed re-profiling, ICU expansion, a maternity complex, and a hemodialysis unit was associated with improved performance: bed occupancy decreased from 92.4% to 84.2%, average length of stay from 14.6 to 9.4 bed-days, and ICU transfers from 15.2% to 9.1%. Stable staffing and resource provision supported institutional resilience during peak and post-COVID periods.

Conclusion: The adaptive organizational model improved hospital manageability, resource efficiency, and institutional resilience, supporting the feasibility of crisis-oriented management approaches under epidemiological instability.

Keywords: *COVID-19, organizational model, hospital, resource management, intensive care*

Introduction

The COVID-19 pandemic posed unprecedented challenges to health systems, requiring rapid transformation of organizational models in specialized infectious hospitals (Omrane A., Bedoui W., et al., 2022). Under conditions of increasing hospitalizations,

resource constraints, and clinical uncertainty, healthcare institutions adopted adaptive management strategies based on flexibility, interdisciplinary collaboration, and rational resource allocation, including crisis management structures and expansion of intensive care capacity (Vahia A., Chaudhry Z. S., et al.,

2021). Innovative care models such as team-based workflows, group rounding, and BPMN 2.0 process modelling improved communication, protocol standardization, and patient safety (Vahia A., Chaudhry Z. S., et al., 2021; Stańczyk A., Rosiak O., 2022). Continuous evaluation and staff feedback supported iterative refinement of organizational strategies and strengthened institutional resilience, while also revealing systemic vulnerabilities such as workforce shortages and communication gaps, emphasizing the need for further development of adaptive healthcare management models (Zhelyazkova A., Fischer P. M., et al., 2022; Głód G., Rogowska K., 2024).

Materials and Methods

This retrospective–prospective organizational study evaluated the effectiveness of an adaptive operational model implemented in the specialized infectious hospital “Zangiota-1” during the COVID-19 pandemic (2020–2025). The analysis included 123,441 hospitalized patients in an aggregated, anonymized format using data from national statistics, medical records, and internal organizational registries. Key outcome indicators were bed occupancy, average length of stay,

ICU transfer rate, staffing adequacy, and resource stability. Organizational-analytical, comparative, and statistical methods were applied, with significance set at $p < 0.05$.

Results

During the pandemic, the Republican Specialized Hospital “Zangiota-1” was transformed into a dedicated infectious disease center functioning as a referral hospital. Its organizational model was structured on a modular principle and included dynamic bed capacity management, functional separation of patient flows, reinforcement of intensive care units, and implementation of a rapid operational management framework. A key component of this model was flexible bed allocation, replacing the pre-pandemic fixed bed structure with dynamic redistribution based on epidemiological trends, patient demographics, clinical characteristics, and disease severity. Dedicated units were established, including a hemodialysis department for patients with chronic kidney disease requiring renal replacement therapy, a maternity complex for pregnant women with COVID-19, and a specialized surgical department (Table 1).

Table 1. Dynamics of Bed Capacity Structure at the Republican Specialized Hospital “Zangiota-1” During the COVID-19 Pandemic

Period	Total beds, n	Therapy, n	ICU, n	Departments		
				Hemodialysis, n	Surgery, n	Maternity complex, n
2020 Q3	2016	1816	180	20	0	0
2020 Q4	2016	1816	180	20	0	0
2021 Q1	2016	1670	180	20	0	146
2021 Q2	2016	1670	180	20	0	146
2021 Q3	2016	1670	180	20	0	146
2021 Q4	1704	1358	180	20	0	146
2022 Q1	1490	1180	144	20	0	146
2022 Q2	1214	918	130	20	0	146
2022 Q3	1110	860	84	20	0	146
2022 Q4	808	540	72	20	30	146
2023 Q1	728	460	72	20	30	146
2023 Q2	528	260	72	20	30	146
2023 Q3	584	340	72	20	30	122

Period	Total beds, n	Therapy, n	ICU, n	Departments		
				Hemodialysis, n	Surgery, n	Maternity complex, n
2023 Q4	508	320	72	20	30	66
2024 Q1	528	300	72	20	30	106
2024 Q2	448	220	72	20	30	106
2024 Q3	488	260	72	20	30	106
2024 Q4	468	260	72	20	30	86
2025 Q1	428	220	72	20	30	86
2025 Q2	436	208	72	20	30	106
2025 Q3	436	220	60	20	30	106

A key organizational principle of “Zangiota-1” was strict functional zoning aimed at minimizing in-hospital infection transmission, with separate clean, semi-clean, and infectious areas and dedicated patient, staff, and material pathways. The hospital model was adapted to changing patient profiles through reinforcement of intensive care capacity, where ICU units evolved into the central coordinating element of clinical management, ensuring early detection of deterioration, patient routing, and timely escalation of care. This approach improved continuity between departments, strengthened process

control, and maintained operational stability during the post-COVID transformation. Management efficiency was further supported by a real-time operational control system that monitored bed occupancy, staffing, critical resources, and departmental reconfiguration, reducing delays in decision-making under rapidly changing epidemiological conditions. Evaluation based on bed utilization, length of stay, and hospital performance during peak periods showed that the adaptive organizational model improved institutional resilience and overall treatment management (Table 2).

Table 2. Key Organizational Performance Indicators of “Zangiota-1” Before and After Implementation of the Adaptive Model

Indicator	Before implementation	After implementation
Bed occupancy rate, %	92.4%	84.2%
Average length of stay, bed-days	14.6%	9.4%
ICU transfer rate, %	15.2%	9.1%

The organizational model of “Zangiota-1,” developed during the COVID-19 pandemic, was characterized by high adaptability, functional integration of hospital units, and strengthened managerial control. Implemented structural solutions ensured stable hospital performance under crisis conditions and established a foundation for further post-COVID transformation of healthcare delivery.

Discussion

The results obtained are consistent with international experience in transforming

specialized infectious hospitals during the COVID-19 pandemic. The adaptive model was based on rapid spatial reconfiguration, centralized resource management, and strengthened infection control. Similar approaches were implemented in the Bergamo field hospital through strict functional zoning and IPC protocols, and in Daegu Dongsan Hospital, where a dedicated emergency task force improved logistics and resource allocation, reducing nosocomial staff infections (Spagnolello O., Rota S., et al., 2020; Kim M., Lee J. Y., et al., 2020). These

examples highlight the importance of centralized management and coordinated operational control.

The concept of the “four safety domains” – facilities, personnel, processes, and systems – emphasizes a comprehensive approach to hospital preparedness under surge conditions (Anesi G. L., Lynch Y., 2020). Within this framework, interdisciplinary coordination, logistical planning, and specialized pathogen response centers play a ключевая role (Brewer B., Schnell N., et al., 2024), while strategic planning of temporary and emergency facilities supports flexible epidemic response (Optimal emergency hospitals construction in an unexpected epi-

demical with considering the interactive effect. 2024). Architectural adaptability, scalable infrastructure, and modular designs further enhance hospital resilience by enabling rapid expansion of capacity and reducing in-hospital transmission risk (Agrawal K., 2024; Kropf E., Zeitz K., 2022).

Conclusion

The adaptive organizational model improved hospital manageability, resource efficiency, and institutional resilience, supporting the feasibility of crisis-oriented management approaches under epidemiological instability.

References

- Omrane A., Bedoui W., et al. (2022). Organizational agility and COVID-19 pandemic management: The case of a public hospital. *Archives des Maladies Professionnelles et de l'Environnement*, – 83(4). – 379 p. URL: <https://doi.org/10.1016/j.admp.2022.07.095>
- Vahia A., Chaudhry Z. S., et al. (2021). Rapid reorganization of an academic infectious diseases program during the COVID-19 pandemic in Detroit: A novel unit-based group rounding model. *Clinical Infectious Diseases*, 72(6), 1074–1080. <https://doi.org/10.1093/cid/ciaa903>
- Stańczyk A., Rosiak O. (2022). The model of work organization on the example of COVID-19 unit according to protocol BPMN 2.0. *Lekarz Wojskowy*, – 100(2). – P. 91–97. URL: <https://doi.org/10.53301/lw/146854>
- Zhelyazkova A., Fischer P. M., et al. (2022). COVID-19 management at one of the largest hospitals in Germany: Concept, evaluation and adaptation. *Health Services Management Research*, – 36(1). – P. 63–74. URL: <https://doi.org/10.1177/09514848221100752>
- Głód G., Rogowska K. (2024). Change management as a key factor in hospital functioning during the SARS-CoV-2 pandemic. *Studia i Prace Kolegium Zarządzania i Finansów*, – 194 p. URL: <https://doi.org/10.33119/sip.2023.194.10>
- Spagnolello O., Rota S., et al. (2020). Bergamo field hospital confronting COVID-19: Operating instructions. *Disaster Medicine and Public Health Preparedness*, – P. 1–3. URL: <https://doi.org/10.1017/DMP.2020.447>
- Kim M., Lee J. Y., et al. (2020). Lessons from a COVID-19 hospital, Republic of Korea. *Bulletin of the World Health Organization*, – 98(12). – P. 842–848. URL: <https://doi.org/10.2471/BLT.20.261016>
- Anesi G. L., Lynch Y. (2020). A conceptual and adaptable approach to hospital preparedness for acute surge events due to emerging infectious diseases. *Critical Care Explorations*, 2(4). <https://doi.org/10.1097/CCE.0000000000000110>
- Brewer B., Schnell N., et al. (2024). Building a special pathogen response center from the ground up. *Antimicrobial Stewardship & Healthcare Epidemiology*, – 4(S1). – 95 p. URL: <https://doi.org/10.1017/ash.2024.238>
- Optimal emergency hospitals construction in an unexpected epidemic with considering the interactive effect. (2024). *International Transactions in Operational Research*. Brewer B., Schnell N., et al. (2024). <https://doi.org/10.1111/itor.13473>
- Agrawal K. (2024). Adaptive architecture and infection prevention in hospitals. *Indian Scientific Journal of Research in Engineering and Management*. <https://doi.org/10.55041/ijrsrem30035>

Kropf E., Zeitz K. (2022). Hospital design features that optimise pandemic response. *Australian Health Review*. Brewer B., Schnell N., et al. (2024). <https://doi.org/10.1071/AH21153>

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